Science, Research and Information Technology

Business Plan 1998-99 to 2000-01

Accountability Statement

This Business Plan for the three years commencing April 1, 1998 was prepared under my direction in accordance with the Government Accountability Act and the government's accounting policies. All of the government's policy decisions as at January 20, 1998 with material economic or fiscal implications of which I am aware have been considered in preparing the Business Plan.

The Ministry's priorities outlined in the Business Plan were developed in the context of the government's business and fiscal plans. I am committed to achieving the planned results laid out in this Business Plan.

Lorne Taylor

Dr. Lorne Taylor
Minister Responsible for Science, Research
and Information Technology
January 27, 1998

Vision

The vision of the Ministry of Science, Research and Information Technology (SRIT) is that "science, research and information technology will contribute to prosperity and quality of life for Albertans".

Introduction

The Science and Research Innovation System includes not only research and development (R&D), but also the dissemination, commercialization, and application of knowledge and technology:

1. **Research and Development** results in creation of new knowledge. Research performers in Alberta include the universities, federal and provincial research institutes and corporate research labs.

2. **Technology Linking** organizations actively transfer ideas, technology and people between research and commercialization and application (e.g., Alberta Research Council, TR Labs).

3. **Commercialization/Application** creates socio-economic benefits for Alberta by converting ideas and technologies into outputs of marketable technology-based products and services.

Although government and the universities are major players in the Science and Research Innovation System, especially in the initial stages, the largest role is played by the many companies and organizations in the private sector that convert technology into products and services that produce socio-economic benefits for Albertans.

Science and research are critical in achieving many of the goals in all three of the Government's core businesses, *people*, *prosperity*, and *preservation*. The primary contribution of science and research is to the government's goals of "Alberta will have a prosperous economy", and "Our businesses will capitalize on research".

The Ministry has five primary areas of responsibility.

Science and Research Policy - SRIT is responsible for developing policy relating to improving the Province's Science and Research system. The Alberta Science and Research Authority (ASRA) advises the Minister Responsible for Science, Research and Information Technology on policy and priorities to enhance the effective utilitization of the Government's investment in science and research.

Interprovincial Science and Research liaison - The Minister Responsible for SRIT has the mandate to represent the Province in interprovincial and national level Science and Research issues. This includes responsibility for the Memorandum of Understanding, "The Coordination of Science and Technology Initiatives for Western Economic Development", and liaison with the Council of Science and Technology Ministers.

Supporting the initiation of strategically important science and research initiatives - ASRA is responsible for making recommendations to the Minister regarding investments from the Alberta Science and Research Fund.

Operation of elements of Alberta's R&D performing and technology transfer infrastructure.

- The Alberta Research Council (ARC) is the primary element of the R&D infrastructure within SRIT.
- Responsibility for the act governing the Alberta Heritage Foundation for Medical Research was transferred to the Minister Responsible for Science, Research and Information Technology by Order in Council dated June 25, 1997.
- Responsibility for Alberta's investment in TRLabs was transferred from Alberta Economic Development to SRIT in December 1997.

Information Technology - The Minister Responsible for SRIT has the mandate to represent the Province in interprovincial and national-level information-technology issues.

The Ministry of Science, Research and Information Technology is composed of two agencies, the Alberta Science and Research Authority (ASRA) and the Alberta Research Council (ARC). Each agency was established under its own act and is managed by a Board of Directors composed largely of private citizens. The Chair of each board reports to the Minister.

To increase the efficiency of SRIT, the Minister intends to table legislation in 1998 to consolidate these two agencies by the beginning of fiscal year 1999/2000.

Alberta Science and Research Authority - 1998-2001 Business Plan

Mission

The mission of ASRA is to enhance the contribution of science and research to the sustainable prosperity and quality of life of all Albertans.

Mandate and Core Businesses

The mandate of the Alberta Science and Research Authority (ASRA) was defined by the *Science and Research Authority Act* (1995) as:

1. Stimulate research and development and related scientific activities in Alberta;
2. Develop a science and research policy and priorities that are compatible with the economic and social priorities of government;
3. Conduct an annual review of all Government science and research policies, priorities, and programs and their compatibility with the economic and social policies and priorities of the Government and recommend to Executive Council the amount of public money that a program should receive;
4. Develop and monitor a financial management plan for the science and research investments of the Government that maximizes returns to economic and social development, minimizes duplication and promotes cooperation.
5. Promote communication on matters related to science and research among the science and research community, business community and general public;

6. Encourage the science and research community and infrastructure in Alberta to attain international excellence, to enable Alberta to be internationally competitive;
7. Evaluate applications for grants under the *Alberta Science and Research Authority Act*;
8. Carry out any other activities related to science and research that the Minister or the Board considers appropriate.

ASRA, which acts as an advisor and influencer to stimulate science and research and encourage a strong economy, is composed of a Board of Management of 25 members and is supported by a small secretariat. The Chair of the Board reports to the Minister.

ASRA promotes the accomplishment of the mission for science and research through two core businesses.

- Develop and promote informed and practical recommendations to the Government related to science and research policies and priorities, provincial government investments in science and research, and science and research infrastructure; and,
- Facilitate the identification, development, and implementation of strategic, high-value, science and research initiatives.

Strategic Intent

The strategic intent of the Alberta Science and Research Authority is to increase the value of the socio-economic benefits to Albertans from science and research investments in Alberta.

ASRA Action Plan

Numbers in parentheses following each activity shows linkage of activities to mandates.

Alberta Innovation Strategy (1, 2, 6)
- Promote implementation of the strategy for Alberta's science and research innovation system, "Sustaining the Alberta Advantage: Investing in Knowledge, Our Most Important Renewable Resource", which ASRA published during 1997, as a discussion draft.

Information Technology (1-8)
- Develop a strategic plan for development of the information technology sector by working with government departments, management bodies and industry organizations.

Tax and Regulatory Environment (1, 2, 8)
- Continue to work with Treasury to develop and implement practicable tax measures that enhance the competitiveness of Alberta's high-knowledge industries.
- Pursue the implementation of the recommendations of the "Barriers to Technology Commercialization in Alberta" Report.

Sector Specific R&D Strategies (1-8)

- Ensure that sector specific plans to increase industry funding for R&D in key sectors are developed and implemented by working with government departments, management bodies and industry organizations.
- Continue to promote the development of an Alberta biotechnology industry association and encourage the development of a biotechnology industry.
- Continue to encourage the coordination of health research in Alberta.

Alberta Government Science and Research (3, 4)

- Review the R&D Plans of government ministries annually and recommend improvements to the provincial government's R&D programs.
- Publish the R&D Plan for Alberta annually based on Ministry R&D plans.
- Publish the Research Overview, an annual report on provincial government R&D activities and results.

Promote Research Excellence (1, 2, 6)

- Develop practical recommendations to promote research excellence in Alberta's universities in consultation and cooperation with Advanced Education and Career Development. **(6)**
- Recommend investments from the Science and Research Fund. **(6, 7)**

Performance Measurement (1, 6, 8)

- Maintain and improve the performance measurement framework for science and research in Alberta.
- Work with Advanced Education and Career Development to develop appropriate measures for Human Capital Capacity.
- Publish the Annual Report on the Performance of Alberta's Innovation System.

Public Awareness and Support for Science and Research (5)

- Facilitate the science promotion efforts of public and private organizations that enhance the science and innovation culture in Alberta.

Performance Measures and Targets

Operational Performance Measures

ASRA's role is as a facilitator, influencer, and catalyst within Alberta's science and research innovation system. In that role, ASRA neither delivers programs nor directly produces outcomes within the innovation system. Successful completion of planned tasks and activities, therefore, constitutes the best measures of ASRA's short-term performance. ASRA will complete and publish the following reports during the planning period.

Report	1998-99	1999-2000	2000-01
Strategy for the Information Technology Sector	X		
Alberta Government R&D Plan	X	X	X
Alberta Research Overview	X	X	X
Annual Report on the Performance of the Alberta Innovation System	X	X	X

International Expert Review Panel

The Minister will appoint an "International Expert Review Panel" to conduct a review of the operations of the ASRA Board pursuant to Article 8(3) of the *Science and Research Authority Act*, during 2000-01.

Measures for the Science and Research Innovation System

In the long term, ASRA's success will be measured by the increase in the contribution of science and research to the prosperity and well being of Albertans. In 1997, ASRA published the first annual report card on the status of the science and research innovation system. The measures cited include (1) R&D Investment, (2) Human Capital Capacity, (3) Research Outputs, (4) Venture Capital Investment in the "Innovation-based Economy", and (5) Economic Performance in the "Innovation-based Economy".

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Alberta Research Council (ARC) Business Plan 1998-2001

Mission and Mandate

We are enablers. In partnership with Albertans, we put reliable knowledge and innovative technology to work. Our purpose is to advance Alberta's economy and quality of life.

The Alberta Research Council (ARC) was established in 1921 by an *Act* of the provincial government. It was the first provincial research organization established in Canada, with a mandate to "conduct research . . . in subjects that may be beneficial to the development of resources or industry that enhance the quality of life of Albertans".

ARC is a market-driven organization employing approximately 500 highly skilled scientists, engineers, technical and support staff. Last year it worked with more than 850 companies, ranging from small start-up firms to multinational corporations, as well as municipal, provincial and federal government departments and agencies.

In carrying out its mission, it is conservatively estimated that $117 million of economic activity was generated this past year as a direct result of the work of the Alberta Research Council with its customers and partners.

In July 1996, responsibility for the Alberta Environmental Centre (AEC) in Vegreville was transferred from Alberta Environmental Protection to the ARC. This business plan reflects the full integration of the two organizations.

Core Businesses

The research and development activities of ARC are focussed in seven key market sectors considered to be of importance to the Alberta economy, and where ARC is uniquely positioned to have the greatest impact. These are: agriculture, biotechnology, environment, energy, forestry, information technologies and manufacturing. The following provides a brief summary of the market focus for each of these areas:

- **Agriculture** - environmentally sound pest, crop and plant management; toxicology of environmental pollutants in both livestock and plants; impact of industrial (including agriculture and food) activities on air, water and land resources essential to sustainable agriculture; value-added products from agricultural waste and by-products; development of animal health products.
- **Biotechnology** - home to one of the largest biotechnology scale-up facilities in North America. Capabilities include process engineering; fermentation optimization and scale-up; and the application of microbial processes for pollution abatement. The pilot plant is capable of manufacturing products such as agricultural inoculants, industrial proteins, and animal health care products (vaccines). Internationally recognized expertise in synthesizing novel carbonhydrates for the treatment of inflammatory diseases.
- **Energy** - product and process improvement for energy-related industries, and technologies for recovery and upgrading heavy oil and bitumen.
- **Environment** - expertise in pollution control, including air biofilter technology and waste incineration; land-based waste management, land reclamation and habitat restoration; combustion system design, thermo fluids dynamics modelling, emissions monitoring and expert systems for performance optimization.

- **Forestry** - expertise in soils, silviculture wildlife, aquatics, trapping effectiveness, forest informatics, solid wood products manufacturing, mechanical pulping, pulp and paper processing and environmental remediation. Specific programs include wildlife and aquatics management, sustainable forest management, engineered wood products, pulp and paper technology, products and processes.
- **Information Technologies** - leaders in the provisions of knowledge of current and emerging advanced computing technologies and their application in business, industry, and the public sector. Specific areas of expertise include: health informatics, knowledge-based systems, scheduling and optimization, network applications, including distributed control systems and distributed databases, 3-dimensional visualization and interaction, and large databases, including spatial databases.
- **Manufacturing** - expertise includes: fluids processing, physical and computational modeling and fluids separation technologies; materials processing, including powdered metals and plastics moulding, industrial materials processing and ceramics; information processing (advanced industrial process modeling and automation).

Corporate Business Goals, Performance Measures and Targets

ARC is a strategic investment for the Government of Alberta in sustaining the 'Alberta Advantage' by ensuring Alberta has a vibrant and innovative knowledge-based economy. This investment not only supports the key areas of the province's business plan: *People, Prosperity and Preservation*, it also provides a superior return on this investment to both the government and people of Alberta — that is, for every one dollar the government invests in ARC, an additional five dollars are returned to the Alberta economy. This impact is achieved through the commercial success of Alberta companies directly as a result of their collaborations with ARC. This is expected to increase to provide a seven to one return by the year 2000-01.

Through its annual customer satisfaction survey, and an annual audit of selected customers and partners, ARC's performance measures have consistently shown an increase during the past three years, as shown in the following table. In fact, in 1996-97, ARC exceeded its targets for economic impact. This positive trend is expected to continue.

ARC will continue to advance Alberta's economy through the following goals, performance measures and targets.

ARC: Business Goals, Performance Measures and Targets

Business Goals	1995/96 Actual	1996/97 Actual	1997/98 Forecast	1998/99 Projection	1999/2000 Projection	2000/01 Projection
Economic Impact ($M)	90	117*	130	140	150	160
Job Creation (direct jobs)	700	732	740	800	850	900
R&D Funding from Private Sector ($M)	15.7	18.7	17.7	20.2	22.7	25.5
Government Investment ($M)	20.3	22.9	22.9	25.0	26.5	26.5
Ratio of Private R&D Investment$/ Government Investment $	0.77	0.83	0.77	0.80	0.86	0.96
Mission Effectiveness (Econ. Impact/Gov't Inv.)	4.4	5.1	5.7	6.1	6.6	7.0
Customer Satisfaction	85%	87%		➡		100%

The decline in private sector R&D investment for 1997-98 is the result of a $3.1 million biotechnology contract concluding in March 1997. Some of this revenue will be recouped through other industrially sponsored research projects and as a result of a very focussed and targeted marketing strategy. It is anticipated that the loss of this contract will be fully recovered in the 1998-99 fiscal year.

The increase in government investment in 1998-99 and 1999-2000 is due to funding approved for the sustainable fibre initiative.

Key Strategies

The Alberta Research Council will achieve its goals and targets through the following key strategies:

1. **Development of our intellectual capital** - implement a human resource development plan; strategically align workforce expertise, capability and capacity to meet current and future needs through an aggressive recruitment plan; develop an intellectual capital model and measurement system, in collaboration with the Office of the Auditor General; collaborate with Alberta's universities and other established research organizations; undertake a benchmarking study to gain an understanding of global best practices, and ARC's relative performance to other similar R&D organizations world-wide.
2. **Enhance our market focus** on technology development and commercialization initiatives to increase economic impact in the province in key market sectors by the following: develop new science and technology opportunities in support of Alberta's three key economic drivers: agriculture, energy and forestry; position ARC's enabling technology businesses: biotechnology, environment, information and manufacturing to provide breakthrough opportunities for emerging clusters in Alberta; and develop an international business and export strategy for ARC's technologies and services, in collaboration with Economic Development (ED).
3. Encourage **private sector R&D** investments in targeted technology development to keep pace with Alberta's international competitors and to generate economic impact and jobs in the province. Promote and emphasize the Joint Research Venture (JRV) and Joint Product Development (JPD) programs as a means of increasing Alberta companies' investment in R&D and technology development. These programs support the government's goal of "our businesses will capitalize on research" by expanding the number of research and technology activities which result in viable commercial products, processes and services. ARC's performance measure, "Private Sector R&D Revenues" specifically addresses this goal.
4. Develop innovative **strategic alliances** in energy, agriculture and forestry industries, and suppliers and contractors to these industries. It is important to also develop innovative strategic alliances and partnerships with potential breakthrough impacts for the province and return on investment. For example, ARC is currently seeking a partnership with a private sector company to create a unique GMP (Good Manufacturing Practices) capability for human health biopharmaceuticals using ARC's large-scale fermentation piloting facilities.
5. Build on the **efficiencies** and **effectiveness** gained as a result of the following: implementation of stage gating; new management systems for contracts, projects and intellectual property; and merger with the Alberta Environmental Centre.
6. Develop and implement a **corporate communications and customer engagement plan** to: demonstrate ARC's value as an investment for the Government of Alberta and the long-term economic and social benefits ARC brings to the province; demonstrate to existing and potential customers and partners ARC's value to Alberta companies, other research organizations, agencies

and universities, locally and internationally; and ensure all ARC employees have a shared vision of the organization, an understanding of the key business strategies and how they, as individuals, can contribute.

Science, Research and Information Technology
Ministry Consolidated Income Statement

(thousands of dollars)

	Comparable 1996-97 Actual	Comparable 1997-98 Budget	Comparable 1997-98 Forecast	1998-99 Estimates	1999-2000 Target	2000-01 Target
REVENUE						
Internal Government Transfers	25,266	29,438	29,438	41,863	33,581	33,843
Other Revenue	23,285	26,186	23,216	24,538	26,402	28,533
Consolidation Adjustments	(25,266)	(29,438)	(29,438)	(41,863)	(33,581)	(33,843)
Consolidated Revenue	23,285	26,186	23,216	24,538	26,402	28,533
EXPENSE						
Program						
Operations Funding and Research Policy	27,027	31,196	31,196	43,645	35,376	35,656
Research Operations	45,159	48,861	45,668	49,515	53,149	55,641
Strategic Research Initiatives	1,500	6,500	6,500	16,500	6,500	6,500
Consolidation Adjustments	(25,266)	(29,438)	(29,438)	(41,863)	(33,581)	(33,843)
Consolidated Expense	48,420	57,119	53,926	67,797	61,444	63,954
Gain (Loss) on Disposal of Capital Assets	-	-	-	-	-	-
Write Down of Capital Assets	(786)	-	-	-	-	-
NET OPERATING RESULT	(25,921)	(30,933)	(30,710)	(43,259)	(35,042)	(35,421)